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REMARKS

The Official Action again rejected all of the claims under 35 U.S.C. § 103(a) for the same reasons as set forth by the first Official Action. In this regard, the Official Action rejected Claims 1-8, 10, 11 and 14-18 as being obvious over U.S. Patent No. 5,513,537 to John R. Brooks, et al. in view of U.S. Patent No. 4,415,811 to Jurgen Beck, et al. Additionally, the Official Action rejected Claim 9 as being obvious over the Brooks '537 patent in view of the Beck '811 patent and further in view of U.S. Patent No. 5,359,525 to Steven Weyenberg, and Claims 12 and 13 as being obvious over the Brooks '537 patent in view of the Beck '811 patent and further in view of U.S. Patent No. 6,295,129 to Svante Bjork. Further, the Official Action rejected Claims 19-41 for generally the same reasons as set forth in conjunction with prior similar claims. As described in detail below, however, all of the claims are patentably distinct from the cited references, taken either individually or in combination. Based upon the following remarks, Applicants respectfully request reconsideration of the present application and allowance of the claims.

1. The Claimed Invention

The system for identifying defects in a composite structure during fabrication of the composite structure is defined by amended independent Claims 1-19 to include a camera for receiving images of the composite structure comprised of a plurality of adjacent composite strips. The plurality of adjacent composite strips are positioned in a common direction. The system of independent Claim 1 includes a processor for processing the images and outputting a response identifying a defect based on the images, while the system of independent Claim 19 recites a memory device for storing the images. The system of independent Claims 1 and 19 each includes a light source positioned at an oblique angle relative to the composite structure for illuminating the composite structure. The light source has an infrared component that is differently reflected by defects in the composite structure than from portions of the composite

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structure that are defect free. As recited by each independent claim, the light source is positioned substantially perpendicular to the common direction of the composite strips.

Similarly, the method of identifying defects in a composite structure during fabrication of the composite structure that is set forth by independent Claim 35 initially positions a camera proximate the composite structure, wherein the composite structure is formed from a plurality of adjacent composite strips positioned in a common direction. The composite structure is illuminated with an obliquely-mounted light source having an infrared component with the illumination being in a direction substantially perpendicular to the common direction of the composite strips. The camera and the light source are moved across a composite structure as images of the composite structure recorded. The images may then be processed to identify defects in the composite structure.

2. The Brooks '537 Patent and the Beck '811 Patent Cannot be Combined

Applicants continue to submit that the Brooks '537 patent and the Beck '811 patent cannot properly be combined in an attempt to obviate the claimed invention as the requisite motivation or suggestion to make such a combination is lacking. In order to properly combine references, a teaching or motivation to combine the references is essential. *In re Fine*, 837 F.2d 1071, 1075 (Fed. Cir. 1988). In fact, the Court of Appeals for the Federal Circuit has state that "[c]ombining prior art references without evidence of such a suggestion, teaching, or motivation simply takes the inventor's disclosure of a blueprint for piecing together the prior art to defeat patentability – the essence of hindsight." *In re Dembiczak*, 50 USPQ2d 1614, 1617 (Fed. Cir. 1999). Although the evidence of a suggestion, teaching or motivation to combine the references commonly comes from the prior art references themselves, the suggestion, teaching or motivation can come from the knowledge of one of ordinary skill in the art or the nature of the problem to be solved. *Id.* In any event, the showing must be clear and particular and "[b]road conclusory statements regarding the teaching effort of multiple references, standing alone, are not 'evidence.'" *Id.*

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In this regard, the Brooks '537 patent is directed to a method and apparatus for determining the tack of a composite prepreg and determining if that tack is within an appropriate range so as to adhere the composite prepreg to a substrate when joined under predetermined conditions. In determining the tack, the method and apparatus of the Brooks '537 patent rely upon reflected light from the adhesive contact area. In contrast, the Beck '811 patent describes an optical scanning apparatus that relies upon light transmitted by an object under evaluation to identify defects in the object. In this regard, a properly formed object with no defects would not allow any light to pass by the object and be collected by the solar cell, while an improperly formed object and/or an object with defects would allow at least some of the light to pass by the object and be collected by the solar cell. Since the Brooks '537 patent and the Beck '811 patent are directed to techniques for solving different problems (e.g., the measurement of tack by the method and apparatus of the Brooks '537 patent and the identification of defects in an object by the optical scanning apparatus of the Beck '811 patent) and since the Brooks and Beck patents rely upon different modes of operation, that is, reflectance in the method and apparatus of the Brooks '537 patent and transmittance in the optical scanning apparatus of the Beck '811 patent, Applicants submit that one of ordinary skill in the art would lack the requisite motivation or suggestion to combine the references.

Applicants' note that the response to the first Official Action similarly urged that the Brooks '537 patent and the Beck '811 patent cannot properly be combined. The final Official Action did not address this issue and continued to rely upon the combination. As such, Applicants continue to traverse the rejection on the basis that the cited references cannot properly be combined.

3. The Claims are Patentably Distinct from the Cited References

Even if the references were to be combined, the system of independent Claims 1 and 19 and the method of independent Claim 35 are patentably distinct from the cited references, taken either individually or in combination, since independent Claims 1 and 19 recite that the light source is positioned substantially perpendicular to the common direction in which the plurality of

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adjacent composite strips are positioned and similarly since the method of independent Claim 35 recites that the composite structure is illuminated in a direction substantially perpendicular to the common direction in which the plurality of adjacent composite strips are positioned. The positioning of the light source in a direction substantially perpendicular to the common direction of the composite strips is not only counter intuitive, but has proven to be quite advantageous. In this regard, as set forth by the present application on page 9, lines 11-23:

It has been observed that the composite structure 14 produces high glare when illuminated obliquely across the direction of placement of strips 16, while producing substantially less glare when illuminated obliquely along the direction of placement of the strips. While conventional systems sought to eliminate the glare, the systems and methods of the present invention seek to exploit the glare. In particular, the systems and methods of the present invention exploit the high-glare/low-glare phenomenon by casting oblique light across the top layer of composite strips in a direction substantially perpendicular to the direction of placement of the strips, which produces a relatively large amount of glare on the top layer. The underlying layers, which produce significantly less glare than the top layer because of their orientation, will show through any gaps or other defects in the top layer and thus be easily located. In addition, twists and other surface defects in the top layer will alter the orientation of the strips in the top layer and thus the glare of the top layer at the defect location.

None of the cited references teach or suggest the fabrication of a composite structure from a plurality of adjacent composite strips, let alone a plurality of adjacent composite strips positioned in a common direction as now recited by the independent claims. The Official Action indicates that "Brooks further discloses the newly added limitation of [the] light source being positioned to illuminate the composite structure in a direction substantially perpendicular to the common direction of the composite strips, (see the figure 8 the light source is not illuminating directly perpendicular i.e. only substantially perpendicular) also, the plurality of adjacent composite strips are positioned in a common direction, (see col. 7, lines 51-56, for the composite strips being the common direction and the figure 8 for the light source as located substantially perpendicular [t]o the common direction)". While the Brooks '537 patent does discuss the fabrication of the composite structure, the composite prepregs are laid one upon another and are not positioned adjacent one another so as to extend in a common direction and to form a layer of

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the composite structure as recited by independent Claims 1, 19 and 35. In this regard, the Brooks '537 patent including that portion that immediately precedes the passage (column 7, lines 51-56) cited by the Examiner describes the strips of prepreg being cut and placed on top of one another. See column 7, lines 41-42. Thus, the strips of prepreg described by the Brooks '537 patent are not arranged adjacent to one another to form a layer as recited by independent Claims 1, 19 and 35. Instead, each strip of prepreg in the Brooks '537 patent forms a layer all by itself since the layers are laid upon one another.

Since the layers of the Brooks '537 patent are not formed of a number of adjacent strips, it is somewhat nonsensical to consider the common direction defined by the adjacent strips of prepreg that form a layer, as further defined by independent Claims 1, 19 and 35. Nonetheless, to the extent that the strips of prepreg define a common direction extending in the plane defined between adjacent strips, the light source does not illuminate the structure in a direction that is substantially perpendicular to that common direction as asserted by the Official Action. In this regard, the light source 224 is disposed at an angle θ to the plane defined between adjacent strips. The angle of incidence is described to be adjustable with 25° being the only example that is provided. See column 11, line 66 – column 12, line 3. In any event, the angle of incidence is not substantially perpendicular to the common direction of the composite strips as recited by independent Claims 1, 19 and 35 and, in fact, is closer to being parallel to the common direction as opposed to perpendicular. Similarly, the other cited references fail to teach or suggest a composite structure having a layer formed of a plurality of adjacent composite strips positioned in a common direction and further fail to teach or suggest a light source positioned substantially perpendicular to the common direction of the composite structure as recited by independent Claims 1, 19 and 35. Thus, any combination of the references likewise fails to teach or suggest a light source positioned substantially perpendicular to the common direction defined by a plurality of adjacent composite strips as set forth by independent Claims 1, 19 and 35. Since the dependant claims include at least the recitations of a respective independent claim, the dependant claims are likewise not taught or suggested by the cited references for at least the foregoing reasons.

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While Applicants acknowledge the discussion provided by the Official Action that "any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning", Applicants continue to submit that the Official Action relies impermissibly upon hindsight in reaching its conclusion that it would be obvious to position a camera and the light source proximate the compaction roller as recited by dependant Claims 17 and 33 and, more particularly, on the head unit as recited by dependant Claims 18 and 34 as there is no support for the statement in the first Official Action (that is incorporated by the final Official Action) that "one obviously can see that the camera and the light unit should be place[d] right on a unit that is closest to the composite structure in order to do the inspection." If the Office persists in maintaining the rejection of these dependant claims, Applicants respectfully submit that a reference be identified in support of the proposition that it would have been obvious to one of ordinary skill in the art to have positioned a camera and the light source as recited by the claimed invention.

For each of the foregoing reasons, Applicants submit that the rejections of the claim under 35 U.S.C. § 103 are therefor overcome.

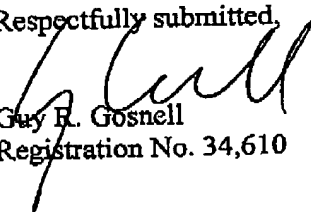
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CONCLUSION

In view of the remarks submitted above, it is respectfully submitted that the present claims are in condition for immediate allowance. It is therefore respectfully requested that a Notice of Allowance be issued. The Examiner is encouraged to contact Applicants' undersigned attorney to resolve any remaining issues in order to expedite examination of the present invention.

It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CAR § 1.136(a), and any fee required therefore (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 16-0605.

Respectfully submitted,


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